



**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Grindstaff et al. Examiner: Lesli Wong  
Serial No. 09/770,031 Group Art Unit: 1761  
Filed: January 25, 2001 Docket No. 707.001US1  
Title: SHAPED CHEESE RECONSTRUCTION WITH TRANSGLUTAMINASE

**MAIL STOP APPEAL BRIEF-PATENTS**

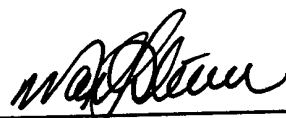
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Alexandria, VA 22313-1450

**The following documents are hereby submitted:**

- ☒ Appeal Brief to the Board of Patent Appeals and Interferences of the United States Patent and Trademark Office (three copies)
- ☒ Authorization to withdraw \$165.00 to cover Appeal Brief Fee of a small entity
- ☒ Transmittal Sheet
- ☒ Return postcard

**Please consider this a PETITION FOR EXTENSION OF TIME for sufficient number of months to enter these papers if an additional extension of time is deemed necessary by the Office. Authorization is hereby given to charge Deposit Account Number 50-1391 if such additional extension is necessary.**

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By:   
Atty: Mark A. Litman  
Reg. No. 26,390

CERTIFICATE UNDER 37 C.F.R. 1.8: The undersigned hereby certifies that this Transmittal Letter and the paper, as described herein, are being deposited in the United States Postal Service, as first class mail, with sufficient postage, in an envelope addressed to: Mail Stop Appeal Brief - Patents, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450 on 14 October 2003

Mark A. Litman  
Name

  
Signature



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**APPEAL BRIEF TO THE BOARD OF  
PATENT APPEALS AND INTERFERENCES OF THE  
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P.O. BOX 1450  
Commissioner for Patents  
Alexandria, VA22313-1450

Sir:

This is an appeal from the Office Action mailed on April 11, 2003 finally rejecting claims 1-13 and 15-18, all of the claims in the Application. All other claims (claim 14) are cancelled.

This Brief is being filed in triplicate along with authorization to debit **\$165.00** to Deposit Account No. 50-1391 to cover the fee for the appeal. Appellants request the opportunity for a personal appearance before the Board of Appeals to argue the issues of this appeal. Any additional costs or fees may also be charged to that Deposit Account. The fee for the personal appearance will be timely paid upon receipt of the Examiner's Answer.

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Mark A. Litman  
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**REAL PARTY IN INTEREST**

The real party in interest is the assignee of the full right and title to this Application, Nutricepts, Inc., a small entity corporation formed under the Laws of the State of Minnesota.

### **RELATED APPEALS AND INTERFERENCES**

Appellants do not know of any other pending U.S. Patent Applications that are on appeal which have issues that overlap with the issues in this Appeal. No Interference proceedings before the U.S. Patent and Trademark Office are known by Appellants to have any substantive relationship to the subject matter of this Appeal.

### **STATUS OF CLAIMS**

Claims 1-13 and 15-18 are rejected under 35 USC 102(b) As Anticipated by Kuraishi et al., U.S. Patent No. 5,681,598

It is asserted that U.S. Patent No. 5,681,598 (Kuraishi et al.) teaches a process for producing cheese using transglutaminase after cheese formation, and using the transglutaminase in the amounts claimed.

Claims 14 was cancelled during the prosecution of the Application

### **STATUS OF AMENDMENTS**

A Request for Reconsideration was filed after the Final Rejection. No amendments to the claims were requested. All amendments filed during the prosecution of this Application have been entered on the record.

### **SUMMARY OF THE INVENTION**

In the manufacture of cheese, there are often significant small pieces or chunks that fall out during the manufacturing process. These pieces are more preferably provided in a commercial environment as larger cheese elements. (Page 15, line 12-30). Merely pressing the cheese pieces together allows for the presence of air to remain in cracks and the attempt at forming larger pieces allows for the cheese to crumble when used.

A process is provided for the structuring of a cheese portion. The process comprises, in sequence:

a) providing portions of curd or cheese in segments of a first average dimension and having a total surface area,

b) adding a composition comprising transglutaminase to at least five percent of said total surface area of the curd or cheese segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments,

c) pressing said portions together to eliminate air between said portions while 1) a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments, and 2) forming a volume of curds or cheese that is larger than a single portion of said portions of curds or cheese, and

d) allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments. (Original claim 1; and page 15, line 26 through page 16, line 15.)

### **ISSUES ON APPEAL**

Claims 1-13 and 15-18 are rejected under 35 USC 102(b) As Anticipated by Kuraishi et al., U.S. Patent No. 5,681,598

It is asserted that U.S. Patent No. 5,681,598 (Kuraishi et al.) teaches a process for producing cheese using transglutaminase after cheese formation, and using the transglutaminase in the amounts claimed.

The generic issue in this Appeal is whether or not the Kuraishi et al. reference teaches each and every limitation of the claims on Appeal within its disclosure.

The specific issues in this Appeal is whether or not the differences in the process noted and identified with particularity during arguments by Appellant show that limitations in the claims are not taught by Kuraishi et al. and that the reference must fail.

### **GROUPING OF CLAIMS**

The following grouping of claims is made in compliance with the requirements of 37 C.F.R. 1.191 for the content of an Appeal Brief. The following grouping of claims is made to expedite this Appeal and narrow issues, and is not intended to waive or limit the right of the Applicants to enforce and defend claims separately, even though they are grouped for convenience in this Appeal.

Claims 1-4, 6-7, 9-13 and 15-17 shall stand or fall with the Patentability of Claim 1 under the Issues on This Appeal

Claims 5, 8 and 18 shall stand or fall with the Patentability of Claim 5

These claims each recite the use of "said curds or cheese is allowed to bond is in the range of about 10-80 hours at a temperature is between 40°F and 125°F."

## **ARGUMENTS OF APPELLANTS - RESPONSE TO THE REJECTIONS**

The rejection under 35 USC 102(b) over Kuraishi et al. is respectfully traversed. The fundamental difference between the practice of the invention and the disclosure of Kuraishi with regard to the use of transglutaminase (TG) may be summarized in the Table below the following comments.

### **Response to the Examiner's Comments**

It is to be noted that the Examiner has asserted that the only difference between the present invention and that of Kuraishi et al. is the size of the surface area to which the transglutaminase is applied. This is clearly in error when the above comparison is reviewed. The intent of the processes are different, and the relative proportions of materials are significantly different. Where Kuraishi et al. are using the transglutaminase before pressing and after washing, the present claims require that the transglutaminase be present during pressing. This is essentially impossible with Kuraishi et al. where the small curds are washed before further processing. These are substantive differences not anticipated by Kuraishi et al. which have not been addressed in the response.

<b>Kuraishi Process</b>	<b>Claimed Process</b>	<b>Comments</b>
Curd is cooked and stirred in aqueous system in presence of TG (column 7, lines 7-34)	Solid curd segments are coated with transglutaminase	The invention process places TG on curd surface rather than being imbibed in curd
Liquid (including TG) is drained from curd, reducing concentration of TG	TG must remain on curd segments during process in applied concentration	Removal of TG removes bonding capability of TG on curd segments
Curd subsequently cut again after TG treatment and drainage of liquid with TG therein	Curd segments are pressed in presence of TG	Recutting removes Tg from surface during subsequent pressing process

**BRIEF ON APPEAL**

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Pressing is done after TG has reacted and after residual TG drained with whey	Pressing must be done in presence of TG to effect bonding	TG cannot bond segments during pressing in Kuraishi as the TG has been removed or reacted
The weight gain in Kuraishi (column 7) appears to be due to reaction of curd with protein in other material in the aqueous matter. There is no bonding of solids with TG to form smooth cheese form	The TG bonds cheese curd segments together at the surface of adjacent curds. The TG must be present during pressing to effect the smooth bond	There is little (less than recited amount) of TG present on surface of curd segments in Kuraishi during pressing step. TG liquid drained, and curd recut to expose new surfaces before draining.

As can be seen from this side-by-side comparison, there are substantial and fundamental differences between the invention as claimed by Applicant and the disclosure of Kuraishi. There is no intention or inherent use of transglutaminase (TG) by Kuraishi to bond segments of curd protein. The treatment by Kuraishi reacts the TG well before pressing, drains TG from the mass prior to pressing, cuts the intermediate curd before pressing, and does not add TG to coat the cut surface of the TG before pressing.

Both the original claims (and as amended) and the new claims 17-18 clearly recite that the transglutaminase must be present on the surface of the curd or cheese segments during pressing, and that the TG effects bonding between the segments. These steps are not possible in the practice of the Kuraishi process. As noted above, the curd is stirred and heated in the presence of TG, bonding the TG to surfaces, without bonding segments together. The liquid, along with any residual TG, is then drained from the curd mass. The curd mass, after draining, but without pressing, is then cut again into smaller pieces and further drained. The drained smaller segments are then milled (broken into

small pieces again), mixed with salt, and then pressed. This process clearly does not and cannot provide TG on the surface of curd segments in the concentration required at the time of pressing. Kuraishi clearly does not anticipate the invention as claimed.

This limitation is clearly and definitively recited in the claims on Appeal. Claim 1 specifically recites:

“...pressing said portions together, while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments...”

As the pressing and ripening step of Kubaishi et al. is performed after washing of the curds and removal of transglutaminase, and then the curds are cut again and heated again, providing new surfaces (by cutting) without the bonding-sufficient amount of transglutaminase, this explicit and critical limitation of the claim, having the transglutaminase present on the curd surface at the beginning of pressing and ripening to enable binding, this limitation cannot be met by Kubaishi et al. and the rejection is clearly in reversible error.

It is equally obvious that the purpose of the addition of the TG in the process of Kuraishi is to build up mass that cannot be drained during initial steps, and that the TG serves no purpose after formation of the original curd mass (that is not and has not been pressed). It would not be obvious to one skilled in the art to destroy the function of Kuraishi to build up mass during curd development and add TG for no functional benefit described in the art at the later step, with a different purpose, as recited in the claims. There would be no rational or

reasoned basis for asserting that the claims are obvious under 35v USC 103(a) over Kuraishi.

Claims 5, 8 and 18 shall stand or fall with the Patentability of Claim 5

Although Kubaishi et al. disclose the use of temperatures (e.g., 27°C, 31°C, 33°C, 37°C and 38°C at various stages of the process. The present claims call for the use of this specific range of temperatures during ripening after the surface addition of the transglutininase. Note all of these temperatures at different stages in Example 1 of Kubaishi et al. for many of these various temperatures that are uniquely specified for particular manufacturing stages (column 7, lines 7-53). Note that no temperature is given during the ripening stage after the milling and salt addition (column 7, lines 36-47). As no temperature is given for this process step, the limitation is not taught by the reference.

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**CONCLUSION**

All rejections of record have been shown in detail to be in error. The rejection should be reversed and all claims should be indicated as allowable.

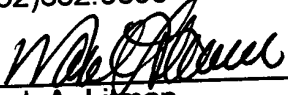
Applicants believe the claims are in condition for allowance and request reconsideration of the application and allowance of the claims. The Examiner is invited to telephone the below-signed attorney at 952-832-9090 to discuss any questions that may remain with respect to the present application.

Respectfully submitted,  
GRINDSTAFF et al.

By their Representatives,  
MARK A. LITMAN & ASSOCIATES, P.A.  
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Edina, MN 55435  
(952)832.9090

Date

By

  
Mark A. Litman  
Reg. No. 26,390

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to MAIL STOP: APPEAL BRIEF - PATENTS, P.O. BOX 1450, Commissioner for Patents, Alexandria, VA 22313-1450 on October \_\_14\_\_, 2003.

Name: Mark A. Litman

  
Signature

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## **APPENDIX - THE CLAIMS ON APPEAL**

1. (PREVIOUSLY AMENDED) A process for the structuring of a cheese portion comprising:
  - providing portions of curd or cheese in segments of a first average dimension and having a total surface area,
  - adding to said segments a composition comprising transglutaminase to at least five percent of said total surface area of said segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area,
  - pressing said portions together, while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments, to eliminate air between said portions while forming a volume of curds or cheese that is larger than [an] a single portion of said portions of curds or cheese,
  - allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese.
2. (ORIGINAL) The process of claim 1 wherein said composition comprises transglutaminase in the presence of less than a 1:1 weight ratio of casein or caseinate to transglutaminase.
3. (PREVIOUSLY AMENDED) The process of claim 1 wherein said composition comprises transglutaminase with less than 10% by weight

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of said transglutaminase composition with respect to cheese protein.

4. (ORIGINAL) The process according to claim 1 wherein said transglutaminase is provided to the curds or cheese in an amount of about 0.01-10.0 units per gram of cheese protein.
5. (ORIGINAL) The process of claim 4 wherein the time in which said curds or cheese is allowed to bond is in the range of about 10-80 hours at a temperature is between 40°F and 125°F.
6. (ORIGINAL) The process according to claim 2 wherein said transglutaminase is provided as a solid mixture of transglutaminase and inorganic filler at a concentration in the range of about 0.02-5 units of transglutaminase per gram of curds or cheese protein.
7. (PREVIOUSLY AMENDED) A process for the structuring of a cheese portion comprising:
  - breaking a single curd portion having a weight of between 2 and 40 kilograms into smaller segments of curd;
  - adding a composition comprising transglutaminase to said smaller segments of curd in an amount of transglutaminase sufficient to chemically bond said smaller segments of curd together,
  - pressing said segments of curd together, while the amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd segments to eliminate air between said segments while forming a volume of curds that is larger than

50 kilograms, and

allowing said transglutaminase to bond said segments of curds together.

8. (ORIGINAL) The process of claim 7 wherein said allowing said transglutaminase to bond said segments of curds together is performed for at least two hours at a temperature between 40°F and 125°F.

9. (ORIGINAL) The process of claim 8 wherein said segments of curd cure to form cheese during said allowing said transglutaminase to bond said segments of curds together.

10. (ORIGINAL) The process of claim 7 wherein said transglutaminase is added as a solid composition to said smaller segments of curds.

11. (ORIGINAL) The process of claim 10 wherein said solid composition of transglutaminase comprises as a mixture of transglutaminase and inorganic solid.

12. (ORIGINAL) The process of claim 7 wherein transglutaminase is added to said smaller segments of curd in an amount of 0.001 to 0.5% by weight of transglutaminase to said smaller curd segments.

13. (ORIGINAL) The process of claim 12 wherein said transglutaminase is added to said smaller curd segments by a physical process including at least one step selected from the group consisting of tumbling, stirring, agitation,

spraying, stirring, and shaking.

14. (PREVIOUSLY CANCELLED)

15. (ORIGINAL) The process of claim 7 wherein said composition comprising transglutaminase comprises transglutaminase in an aqueous carrier, and the composition is free of ingredients that will chemically bond with said transglutaminase.

16. The process of claim 12 wherein said smaller segments of curd are chemically bonded by said transglutaminase reacting solely with protein in said smaller curd segments.

17. (PREVIOUSLY ADDED) A process for the structuring of a cheese portion comprising the following steps in sequence:

- a) providing portions of curd or cheese in segments of a first average dimension and having a total surface area,
- b) adding a composition comprising transglutaminase to at least five percent of said total surface area of the curd or cheese segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments,
- c) pressing said portions together to eliminate air between said portions while 1) a bonding-sufficient amount of transglutaminase to said total surface area of the curd or

cheese segments is present on the surface of the curd or cheese segments, and 2) forming a volume of curds or cheese that is larger than a single portion of said portions of curds or cheese, and

- d) allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments.

18. (PREVIOUSLY ADDED) The process of claim 17 wherein said allowing said transglutaminase to bond said segments of curds together is performed for at least two hours at a temperature between 40°F and 125°F.



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**REAL PARTY IN INTEREST**

The real party in interest is the assignee of the full right and title to this Application, Nutricepts, Inc., a small entity corporation formed under the Laws of the State of Minnesota.

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In the manufacture of cheese, there are often significant small pieces or chunks that fall out during the manufacturing process. These pieces are more preferably provided in a commercial environment as larger cheese elements. (Page 15, line 12-30). Merely pressing the cheese pieces together allows for the presence of air to remain in cracks and the attempt at forming larger pieces allows for the cheese to crumble when used.

A process is provided for the structuring of a cheese portion. The process comprises, in sequence:

a) providing portions of curd or cheese in segments of a first average dimension and having a total surface area,

b) adding a composition comprising transglutaminase to at least five percent of said total surface area of the curd or cheese segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments,

c) pressing said portions together to eliminate air between said portions while 1) a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments, and 2) forming a volume of curds or cheese that is larger than a single portion of said portions of curds or cheese, and

d) allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments. (Original claim 1; and page 15, line 26 through page 16, line 15.)

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Claims 5, 8 and 18 shall stand or fall with the Patentability of Claim 5

These claims each recite the use of "said curds or cheese is allowed to bond is in the range of about 10-80 hours at a temperature is between 40°F and 125°F."

## **ARGUMENTS OF APPELLANTS - RESPONSE TO THE REJECTIONS**

The rejection under 35 USC 102(b) over Kuraishi et al. is respectfully traversed. The fundamental difference between the practice of the invention and the disclosure of Kuraishi with regard to the use of transglutaminase (TG) may be summarized in the Table below the following comments.

### **Response to the Examiner's Comments**

It is to be noted that the Examiner has asserted that the only difference between the present invention and that of Kuraishi et al. is the size of the surface area to which the transglutaminase is applied. This is clearly in error when the above comparison is reviewed. The intent of the processes are different, and the relative proportions of materials are significantly different. Where Kuraishi et al. are using the transglutaminase before pressing and after washing, the present claims require that the transglutaminase be present during pressing. This is essentially impossible with Kuraishi et al. where the small curds are washed before further processing. These are substantive differences not anticipated by Kuraishi et al. which have not been addressed in the response.

<b>Kuraishi Process</b>	<b>Claimed Process</b>	<b>Comments</b>
Curd is cooked and stirred in aqueous system in presence of TG (column 7, lines 7-34)	Solid curd segments are coated with transglutaminase	The invention process places TG on curd surface rather than being imbibed in curd
Liquid (including TG) is drained from curd, reducing concentration of TG	TG must remain on curd segments during process in applied concentration	Removal of TG removes bonding capability of TG on curd segments
Curd subsequently cut again after TG treatment and drainage of liquid with TG therein	Curd segments are pressed in presence of TG	Recutting removes TG from surface during subsequent pressing process

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Pressing is done after TG has reacted and after residual TG drained with whey	Pressing must be done in presence of TG to effect bonding	TG cannot bond segments during pressing in Kuraishi as the TG has been removed or reacted
The weight gain in Kuraishi (column 7) appears to be due to reaction of curd with protein in other material in the aqueous matter. There is no bonding of solids with TG to form smooth cheese form	The TG bonds cheese curd segments together at the surface of adjacent curds. The TG must be present during pressing to effect the smooth bond	There is little (less than recited amount) of TG present on surface of curd segments in Kuraishi during pressing step. TG liquid drained, and curd recut to expose new surfaces before draining.

As can be seen from this side-by-side comparison, there are substantial and fundamental differences between the invention as claimed by Applicant and the disclosure of Kuraishi. There is no intention or inherent use of transglutaminase (TG) by Kuraishi to bond segments of curd protein. The treatment by Kuraishi reacts the TG well before pressing, drains TG from the mass prior to pressing, cuts the intermediate curd before pressing, and does not add TG to coat the cut surface of the TG before pressing.

Both the original claims (and as amended) and the new claims 17-18 clearly recite that the transglutaminase must be present on the surface of the curd or cheese segments during pressing, and that the TG effects bonding between the segments. These steps are not possible in the practice of the Kuraishi process. As noted above, the curd is stirred and heated in the presence of TG, bonding the TG to surfaces, without bonding segments together. The curd liquid, along with any residual TG, is then drained from the curd mass. The curd mass, after draining, but without pressing, is then cut again into smaller pieces and further drained. The drained smaller segments are then milled (broken into

small pieces again), mixed with salt, and then pressed. This process clearly does not and cannot provide TG on the surface of curd segments in the concentration required at the time of pressing. Kuraishi clearly does not anticipate the invention as claimed.

This limitation is clearly and definitively recited in the claims on Appeal.

Claim 1 specifically recites:

“...pressing said portions together, while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments...”

As the pressing and ripening step of Kubaishi et al. is performed after washing of the curds and removal of transglutaminase, and then the curds are cut again and heated again, providing new surfaces (by cutting) without the bonding-sufficient amount of transglutaminase, this explicit and critical limitation of the claim, having the transglutaminase present on the curd surface at the beginning of pressing and ripening to enable binding, this limitation cannot be met by Kubaishi et al. and the rejection is clearly in reversible error.

It is equally obvious that the purpose of the addition of the TG in the process of Kuraishi is to build up mass that cannot be drained during initial steps, and that the TG serves no purpose after formation of the original curd mass (that is not and has not been pressed). It would not be obvious to one skilled in the art to destroy the function of Kuraishi to build up mass during curd development and add TG for no functional benefit described in the art at the later step, with a different purpose, as recited in the claims. There would be no rational or

reasoned basis for asserting that the claims are obvious under 35v USC 103(a) over Kuraishi.

Claims 5, 8 and 18 shall stand or fall with the Patentability of Claim 5

Although Kubaishi et al. disclose the use of temperatures (e.g., 27°C, 31°C, 33°C, 37°C and 38°C at various stages of the process. The present claims call for the use of this specific range of temperatures during ripening after the surface addition of the transglutininase. Note all of these temperatures at different stages in Example 1 of Kubaishi et al. for many of these various temperatures that are uniquely specified for particular manufacturing stages (column 7, lines 7-53). Note that no temperature is given during the ripening stage after the milling and salt addition (column 7, lines 36-47). As no temperature is given for this process step, the limitation is not taught by the reference.

**BRIEF ON APPEAL**

Serial Number: 09/ 770,031

Filing Date: January 26, 2001

Title: SHAPED CHEESE RECONSTRUCTION WITH TRANSGLUTAMINASE

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**CONCLUSION**

All rejections of record have been shown in detail to be in error. The rejection should be reversed and all claims should be indicated as allowable.

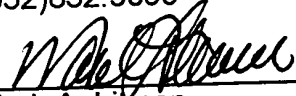
Applicants believe the claims are in condition for allowance and request reconsideration of the application and allowance of the claims. The Examiner is invited to telephone the below-signed attorney at 952-832-9090 to discuss any questions that may remain with respect to the present application.

Respectfully submitted,  
GRINDSTAFF et al.

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to MAIL STOP: APPEAL BRIEF - PATENTS, P.O. BOX 1450, Commissioner for Patents, Alexandria, VA 22313-1450 on October 14, 2003.

Name: Mark A. Litman

  
Signature

## APPENDIX - THE CLAIMS ON APPEAL

1. (PREVIOUSLY AMENDED) A process for the structuring of a cheese portion comprising:  
providing portions of curd or cheese in segments of a first average dimension and having a total surface area,  
adding to said segments a composition comprising transglutaminase to at least five percent of said total surface area of said segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area,  
pressing said portions together, while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments, to eliminate air between said portions while forming a volume of curds or cheese that is larger than [an] a single portion of said portions of curds or cheese,  
allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese.
2. (ORIGINAL) The process of claim 1 wherein said composition comprises transglutaminase in the presence of less than a 1:1 weight ratio of casein or caseinate to transglutaminase.
3. (PREVIOUSLY AMENDED) The process of claim 1 wherein said composition comprises transglutaminase with less than 10% by weight

of said transglutaminase composition with respect to cheese protein.

4. (ORIGINAL) The process according to claim 1 wherein said transglutaminase is provided to the curds or cheese in an amount of about 0.01-10.0 units per gram of cheese protein.
5. (ORIGINAL) The process of claim 4 wherein the time in which said curds or cheese is allowed to bond is in the range of about 10-80 hours at a temperature is between 40°F and 125°F.
6. (ORIGINAL) The process according to claim 2 wherein said transglutaminase is provided as a solid mixture of transglutaminase and inorganic filler at a concentration in the range of about 0.02-5 units of transglutaminase per gram of curds or cheese protein.
7. (PREVIOUSLY AMENDED) A process for the structuring of a cheese portion comprising:
  - breaking a single curd portion having a weight of between 2 and 40 kilograms into smaller segments of curd;
  - adding a composition comprising transglutaminase to said smaller segments of curd in an amount of transglutaminase sufficient to chemically bond said smaller segments of curd together,
  - pressing said segments of curd together, while the amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd segments to eliminate air between said segments while forming a volume of curds that is larger than

50 kilograms, and

allowing said transglutaminase to bond said segments of curds together.

8. (ORIGINAL) The process of claim 7 wherein said allowing said transglutaminase to bond said segments of curds together is performed for at least two hours at a temperature between 40°F and 125°F.

9. (ORIGINAL) The process of claim 8 wherein said segments of curd cure to form cheese during said allowing said transglutaminase to bond said segments of curds together.

10. (ORIGINAL) The process of claim 7 wherein said transglutaminase is added as a solid composition to said smaller segments of curds.

11. (ORIGINAL) The process of claim 10 wherein said solid composition of transglutaminase comprises as a mixture of transglutaminase and inorganic solid.

12. (ORIGINAL) The process of claim 7 wherein transglutaminase is added to said smaller segments of curd in an amount of 0.001 to 0.5% by weight of transglutaminase to said smaller curd segments.

13. (ORIGINAL) The process of claim 12 wherein said transglutaminase is added to said smaller curd segments by a physical process including at least one step selected from the group consisting of tumbling, stirring, agitation,

spraying, stirring, and shaking.

14. (PREVIOUSLY CANCELLED)

15. (ORIGINAL) The process of claim 7 wherein said composition comprising transglutaminase comprises transglutaminase in an aqueous carrier, and the composition is free of ingredients that will chemically bond with said transglutaminase.

16. The process of claim 12 wherein said smaller segments of curd are chemically bonded by said transglutaminase reacting solely with protein in said smaller curd segments.

17. (PREVIOUSLY ADDED) A process for the structuring of a cheese portion comprising the following steps in sequence:

- a) providing portions of curd or cheese in segments of a first average dimension and having a total surface area,
- b) adding a composition comprising transglutaminase to at least five percent of said total surface area of the curd or cheese segments, said composition providing a bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments,
- c) pressing said portions together to eliminate air between said portions while 1) a bonding-sufficient amount of transglutaminase to said total surface area of the curd or

cheese segments is present on the surface of the curd or cheese segments, and 2) forming a volume of curds or cheese that is larger than a single portion of said portions of curds or cheese, and

- d) allowing said transglutaminase to bond said portions of curds or cheese together to form a unit of cheese while the bonding-sufficient amount of transglutaminase to said total surface area of the curd or cheese segments is present on the surface of the curd or cheese segments.

18. (PREVIOUSLY ADDED) The process of claim 17 wherein said allowing said transglutaminase to bond said segments of curds together is performed for at least two hours at a temperature between 40°F and 125°F.